



The Role of Ethics in Business Information: Narrative Literature Review

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ARTICLE INFO

Article history:

Received 08 March 2024

Revised 18 June 2024

Accepted 21 June 2024

Available online 31 July 2024

E-ISSN: 2580-829X

P-ISSN: 2580-6769

How to cite:

Cindy Aprilia, "The Role of Ethics in Business Information: Narrative Literature Review", Data Science : Journal Of Computing And Applied Informatics, vol.8, no.2, July 2024, doi: <http://doi.org/10.32734/jocai.v8.i2-15855>



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<http://doi.org/10.32734/jocai.v8.i2-15855>

ABSTRACT

This paper investigates the critical role of ethics in business information, highlighting the challenges posed by the rapid evolution of ICT, which can hardly be addressed by formal legislative responses. A narrative literature review has been conducted to study how computer ethics acts as guidance in addressing the ambiguities and "grey areas" encountered in this field. Through a detailed exploration of the definitions, importance, objectives, and dimensions of computer ethics, the study showcases real-life examples of ethical dilemmas in information rights, property rights, accountability, system quality, and quality of life. The paper concludes that integrating ethical considerations into business practices is essential for responsible and sustainable digital transformation and for filling the gaps where laws may still blur.

Keyword: Computer Ethics, Business Information Technology, Digital Transformation, Ethical Dilemmas, ICT, Legal Ambiguities, Sustainable Digital Transformation

ABSTRAK

Karya tulis ini membahas mengenai peran daripada etika terhadap perkembangan bisnis terkait teknologi informasi, dengan menekankan terhadap tantangan yang dihadapi oleh bisnis terkait perubahan ICT yang sangat cepat, dan sulit terkejar oleh perubahan legalitas. Penelitian dengan tinjauan literatur naratif dilakukan untuk mempelajari bagaimana etika dapat memberikan tuntunan untuk menghadapi ambiguitas dan "area abu-abu" daripada penerapan teknologi didalam bisnis terkait teknologi informasi. Melalui eksplorasi terperinci mengenai definisi, kepentingan, tujuan, dan dimensi etika komputer, penelitian ini menampilkan contoh nyata dilema etika dalam hak informasi, hak milik, akuntabilitas, kualitas sistem, dan kualitas hidup. Karya tulis ini menyimpulkan bahwa mengintegrasikan pertimbangan etis ke dalam praktik bisnis sangat penting untuk transformasi digital yang bertanggung jawab dan berkelanjutan serta untuk mengisi kesenjangan di mana undang-undang masih kabur.

Keyword: Etika Komputer, Bisnis Teknologi dan Informasi, Transformasi Digital, Dilema Etika, ICT, Ambiguitas atas Legalitas, Transformasi Digital Berkelanjutan.

1 Introduction

ICT is an indispensable part of the modern business process [1]. Hence, the technological system's explicit regulations are crucial as the foundation of acts. But, in this constantly evolving industry, new situations arise every day. The old rules frequently do not encompass these new situations. It may take years to build formal responsibilities, politically correct attitudes, and/or accepted rules [2] [3].

Developing new rules and/or laws takes time for formal institutions, and they frequently wait until there has been evidence of actual harm before taking any action. ICT practitioners may find themselves compelled to operate within a zone of legal ambiguity [4]. There are many real-life cases and (later on) categorizations of

these situations, which may become a consideration basis for future actions and decisions that must be taken when these "gray area" cases reappear in the future.

In this work we conducted an narrative literature review to study what are the role of ethic to mediate grey areas of business information, aiming to answer these research questions: (Main RQ) What is the role of computer ethic in business information and why do we need ethics, when there are formal laws?

(Sub-RQ1) What is the definition of computer ethics, viewed from business sector?

(Sub-RQ2) What is the importance of ethic?

(Sub-RQ3) What is the objectives or goals of computer ethics?

(Sub-RQ4) What are the dimensions of computer ethic?

2 Literature Review

This section aims to provide a comprehensive exploration of fundamental terms within the domains of ethics, business, and information system. The following subsections present the precise key concepts of this study:

2.1 Ethics

According to Lee and Chan (2008) [5], ethics is a normative framework that governs individuals' conduct, assessment of worth or positive aspects of objects and circumstances, and the pursuit of fairness within official and casual practices.

Similarly, Laudon and Laudon (2020) define ethics as principles of correct and incorrect that ask as the base of moral agents to make choices for guiding their behavior [2].

In a similar vein, Turban, et al. (2011) conceptualize ethics as a philosophical discipline concerned with discerning the distinction between what is considered morally right and morally wrong [6].

All of previous researchers collectively emphasize that ethics is a concept that distinguishes between morally right and wrong decisions taken by humans. This comprehensive understanding of ethics sets the foundation for further exploration of its implications in business information.

2.2 Computer Ethics

Computer Ethics was proposed in the 1940s by Norbert Wiener when he predicted computing technology's potential social and ethical implications while working on developing WWII anti-aircraft weaponry [7].

Since then, computer ethic has been studied as one of the sub-disciplines of ICT. According to J.H. Moor (1985), computer ethics is the analysis of ICT's environmental and social impacts, along with the corresponding formulation and justification of policies for using such technology, based on ethic's viewpoint [8].

2.3 Business

According to Cambridge Online Dictionary, business can be defined as activity of buying and selling goods and services, or a particular company that does this, or work in general rather than pleasure.

2.4 Work Station

Steven Alter (2019) defining work system (WS) as a complex entity where human participants and/or machines collaborate to carry out various processes and tasks, utilizing ICT resources for serving both internal and external customers [3].

To achieve WS missions, it is crucial for WSs to be aligned with the strategic objectives of the enterprise and individual departments. Therefore, it is essential to consider the nine key elements outlined in the work system framework. These elements encompass customers, products/services, processes and activities, participants, information, technologies, environment, infrastructure, and strategies.

2.5 Business Informatics

Elizabeth Hardcastle in her book (Business Information System), defined business information system as a group of connected components that work simultaneously to carry out input, processing, output, and storage, and control actions for converting data into information products, that can be used to support forecasting, planning, control, coordination, decision making and operational activities in an organization [9].

Turban, et al. (2011) further break down business informatics classification into IT business alignment for prioritizing the business resources and targets, and IT strategic planning for strategizing company future plans [6].

2.6 Ethics in Business information

This section provides a consolidated definition of ethics in business information based on previous sub-sections. Therefore, ethics in business information refers to the principles and norms that govern individuals' conduct, decision-making, and evaluation of value within the context of utilizing information technology and systems in business activities, ensuring alignment with moral standards and the pursuit of justice.

3 Methodology

This study employs a narrative literature review methodology to explore the role of ethics in business information technology. This method facilitates collecting information and taking summary from various types of previous study, including theoretical discussions, empirical studies, and paper discussing real-world case analyses, thus providing a comprehensive understanding of the complex interplay between ethics and business information technology.

3.1 Literature Search Strategy

The initial phase of the literature searching was collecting accredited academic publications and books in connected areas, as well as a thorough search on Google Scholar and various news outlets. Various keywords under the realm of Business, Sustainable, and Technology were used to ensure a wide coverage of the relevant literature.

3.2 Snowballing Technique

Following the initial search, the snowballing technique was employed to extend the data collection. This method involved examining the reference lists of the key articles and books identified in the initial search to discover additional sources that were not captured in the original search. The articles were snowballed up to 4 times for ensuring a comprehensive coverage of the topic. To help maintain the focus of the snowballing process, a protocol document to record the snowballing process was made.

Table 1 Snowballing steps summary

Step No	Snowballing Focus (RQ-no)	General Search Queries
1	(Sub-RQ1), (Sub-RQ-2), (Sub-RQ-3)	("BUSINESS" OR "COMPAN*" OR "INDUSTR*" OR "CORPORATE*") AND ("SOCIAL RESPONSIBILITY" OR "ETHIC*" OR "RESPONSIBL*") AND ("INFORMATION TECHNOLOGY" OR "ICT" OR "COMPUTER" OR "COMPUTING" OR "IT-BUSINESS ANALYSIS" OR "BUSINESS INFORMATICS" OR "GREEN-IT" OR "GREEN-ICT" OR "INFORMATION SYSTEMS") AND ("DEFINITION")
2	(Sub-RQ-3)	("Corporate Social Responsibility") AND ("Slow Tech") AND (Author:"Norberto Patrignani" OR Author:"Diane Whitehouse")
3	(Sub-RQ-4)	("CORPORATE") AND ("ETHIC*" OR "CONCERN*") AND ("INFORMATION SYSTEM") AND ("DIMENSION*" OR "CATEGORY*" OR "TYPE*")

4.1	(Sub-RQ-4) 1 st dimension	System Quality
4.2	(Sub-RQ-4) 2 nd dimension	Property Rights, Patent, Copyright, Trademarks
4.3	(Sub-RQ-4) 3 rd dimension	("BUSINESS" OR "COMPAN*" OR "INDUSTR*" OR "CORPORATE*") AND ("SOCIAL RESPONSIBILITY" OR "ETHIC*" OR "RESPONSIBL*") AND ("INFORMATION TECHNOLOGY" OR "ICT" OR "COMPUTER" OR "COMPUTING" OR "IT-BUSINESS ANALYSIS" OR "BUSINESS INFORMATICS" OR "GREEN-IT" OR "GREEN-ICT" OR "INFORMATION SYSTEMS") AND ("DEFINITION")
4.4	(Sub-RQ-4) 4 th dimension	System Quality, Delta Airlines System Failure 2016
4.5	(Sub-RQ-4) 5 th dimension	Health

3.3 Inclusion and Exclusion Criteria

To maintain the focus and quality of the review, clear inclusion and exclusion criteria were established. Sources were included if they provided significant insights into the ethical considerations in business information technology, addressed one or more of the research questions, or presented case studies relevant to the topic. Excluded were sources that did not directly address the intersection of ethics and business information technology or those that were not from peer-reviewed journals, accredited academic publishers, or recognized expert authors in the field.

3.4.1 Inclusion Criteria

The detailed inclusion criteria for literature selection are defined below:

- Selected article, journal, paper, or related chapters of the books can be found and accessed at collecting period.
- Selected article, journal, paper, or related chapters of the books were written in English
- Selected article, journal, paper, or related chapters of the books related to the focus topic of each of the snowballing steps.
- Selected article, journal, paper, or related chapters of the books for extracting case samples of ethical dilemma are focus on corporate environment in IT industry or industries that employing IT.

3.4.2 Exclusion Criteria

The detailed exclusion criteria for literature selection are defined below:

- Article, journal, paper, or related chapters of the books, which were inaccessible at collecting period.
- Article, journal, paper, or related chapters of the books, which were not written in English.
- Article, journal, paper, or related chapters of the books, which are not related to the focus topic of each of the snowballing steps.
- Article, journal, paper, or related chapters of the books for extracting case samples of ethical dilemma are not focus on corporate environment in IT industry or industries that employing IT.

3.4 Data Extraction and Synthesis

To provide detailed analysis, a systematic approach of literature selection was employed. Each source identified for inclusion in the review was subjected to a detailed analysis. Key information related to the author's perspective towards computer ethics, definitions and dimensions of ethics in business information, and samples of ethical dilemma were extracted. This information was then merged to create a narrative that

addresses the research questions, highlighting the role of ethics in navigating the complexities of business information technology in the modern digital landscape

4 Importance of Computer Ethics in Business Information

ICT is a fast-changing industry, due to digital transformation. However, formal laws usually cannot catch up with its revolution [2] [3]. Therefore, the flexibility of ethics as a framework to define right and wrong is crucial.

Computer ethic may be the basic framework to decide future and existing impacts of ICT [5]. It encompasses privacy, security, and ethical issues and providing trustworthiness [3].

In the sense of business information, computer ethics are closely connected to corporate policies due to the recognition of information as a valuable asset for organizations. Consequently, the protection of information becomes crucial, leading to the integration of information security within corporate policies. Furthermore, effective information security management is considered an indispensable component of overall corporate management [5].

5 The Objectives of Computer Ethics

Hammons, Patrignani, and Whitehouse, in their 2017 paper, "The Slow Tech Journey: An Approach to Teaching Corporate Social Responsibility – Part 1," proposed Slow Tech principles.

Slow Tech proactively provides a positive and constructive direction for developing “good, clean, and fair” ICT. It offers a novel perspective for designing systems that takes into consideration the long-term desirability and social significance of technologies, their impact on the environment and sustainability, as well as the equitable treatment of workers [10].

- Good ICT refers to the design of technologies with consideration for human limitations. It emphasizes that user experiences can only be enjoyable when systems are created while taking into account human capabilities. ICT is considered beneficial for humans when a human-centered approach is adopted in the design process, acknowledging the intricate interactions between individuals and ICT [11].
- Clean ICT recognizes that ICT can generate toxic hazards at various stages of its lifecycle, including design, production, consumption, and disposal. Therefore, the clean aspect of Slow Tech emphasizes the importance of considering the environmental impact of ICT [11].
- Fair ICT takes into consideration the working conditions of workers across the entire supply chain. It contrasts with current practices that lack transparency and often prioritize cost-efficiency over the well-being of workers, resulting in cheap systems [11].

6 Dimension of Computer Ethics

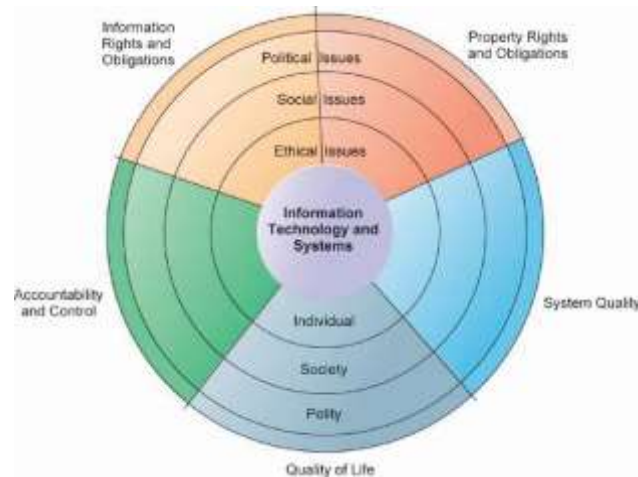


Figure 1. Laudon and Laudon's five moral dimensions

The introduction of information technology creates a series of consequences, rising new issues of ethical, social, and political that require attention at personal, societal, and political levels. Laudon and Laudon (2020) have categorized these concerns under five moral aspects [2]:

6.1 Information rights and obligations

Privacy is the assertion by individuals to remain unnoticed and unharmed by surveillance or interference from external entities, including other individuals and the state. The claim to privacy also applies to the workplace. However, many companies continue to monitor their employees' internet activities in order to prevent the misuse of company resources for non-work-related purposes. These companies, nonetheless, present an indisputable argument for their actions, as they assert their right to use information systems to enhance productivity and efficiency [2].

This is an example of ethical predicaments scenarios that have been introduced due to conflict interests between information system stakeholders, where both sides are legally correct. Therefore, ethic need to be applied here for finding the right balance between the two sides.

6.2 Property rights and obligations

Intellectual property encompasses both tangible and intangible creations of individuals or corporations. Information technology has posed challenges in intellectual property protection, as digital information can be easily copied or shared over networks. Intellectual property is safeguarded through various legal frameworks, including copyright, patents, trademarks, and trade secrets [2].

Copyright is a legal instrument to prevent unauthorized use or reproduction for any purpose of creators' original works (including literary, artistic, and scientific creations) during the author's life plus 70 years after their death [2].

A patent is an exclusive right granted to inventors to prevent others for unauthorized making, using, or selling their invention for a certain period (usually 20 years from the filing date of the application). Patents is allowing an idea to be widespread used, while still financially rewarding the inventors by selling license [2].

Trademarks are visual symbols that identify and differentiate a company's products or services. Trademark laws protect companies' brand reputation and ensuring customer for receiving the products and services they expect and paid for [2].

A trade secret is any confidential business information, such as formulas, processes, or customer lists, that provides a competitive advantage to its owner. Trade secret laws protect businesses from competitors, as long as the information are not based on public domain [2].

6.3 Accountability and control

Responsibility entails acknowledging the possible expenses, responsibilities, and duties associated with the decisions made. Accountability serves as a means of identifying the individuals who took action and are accountable for their actions. Meanwhile, liability is a characteristic of political systems that involves a set of laws allowing individuals to seek compensation for the harm caused to them by other individuals, systems, or organizations [2].

Accountability applies on both building and using system phase. A responsibility assignment matrix defines roles and responsibilities within a project, distinguishing between persons or organizations with responsibility and accountability [12].

On development phase, the accountability and responsibility may be break down into three stages: project management, implementation and testing. On project management stage of developing system, responsibility and accountability are showcased on systematic record-keeping, which is mechanism for retaining logs and other documents, such as procurement records and risk assessment records. On implementation, this dimension is covered by ethical data control, independent audit system, and following professional guidelines (e.g., ACM, IEEE). Meanwhile, independent investigations will be the standard for testing stage [13].

6.4 System quality

System quality is measured by attributes such as ease of use, functionality, reliability, data quality, flexibility, and integration [14] [15].

In general, holding software producers accountable for their software products is very difficult, which are often treated similarly to books, regardless of any resulting physical or economic damage. However, software users have grown to believe that software should be error-free, even though the software is harder to be evaluated in comparison to other software products. Considering the pervasive role of software in daily activities, it is likely that liability laws will expand to encompass software, even in cases where the software solely provides an informational service [2].

6.5 Quality of life

As it is hard to hold them accountable for unmeasurable negative consequences of information systems, the balance of good and bad consequences of using information systems must be frequently considered. Computers and information technologies can destroy valuable elements of our culture and society even while they bring us benefits [2].

Examples of this situation such as centralized power in the hand of the people that control data and information, rapid response time toward world changes, a decrease in jobs (and job benefits), no work-life balance, computer abuse and crime, inequality and exclusivity, technology dependency, and health risk [2].

7 The Examples of Ethics Challenges

7.1 Information rights and obligations

Spam is junk e-mail sent by an organization or individual to a mass audience of Internet users who have expressed no interest in the product or service being marketed. Even though, spams are wasting resource (72% of emails were spams on 2012), it is still legal in United States if it does not involve fraud and the sender and subject of the e-mail are properly identified [2].

There are many other cases of which action are legal (within the rules of the market and regulation of the laws), but inside "grey areas" of ethically correct. Other example is Google-collected users' data.

Back before 2000, Silicon Valley's businesses models were still uncharted and revenue generation was still a puzzle, because many companies would aim for growth rather than profit. However, '2000-dot-com-bubble-burst' caused panic in the market and raised risk of investments. This situation made many investors abandoned the companies and companies were forced to find new ways to generate revenue. The new "mantra" for Silicon Valley investors was "an ability to show sustained and exponential profits".

Google have abundance of users search data. The data that looked like taking storage spaces, saved only for giving future search recommendation suddenly turned into treasure chest. They realized the data can be used to run targeted, personalized ads for its users and thus generate revenue. That led to the new pattern of "behavioral value reinvestment cycle", which would constitute to what Zuboff defines as "surveillance capitalism" [16].

After decade of depending purely on ethic to cover the situation, EU General Data Protection Regulation (GDPR) replaced the previously Data Protection Directive and strengthen "right to be forgotten". "Right to be

forgotten" is the right for user data only be kept by certain period of time, used only for formally consented purposes, and users can ask their private data to be deleted [6].

These two cases showed how sometimes law cannot cover the grey area of computer usage or some actions were correct at certain time period, but the ethical view of it changes over time. Many times, it takes years for making a law that can cover this situation. Moreover, many times an action in gray area cannot be prevent fully, as it is mandatory to keep the business running. Therefore, ethic is needed to protect users at these "grey areas".

7.2 Property rights and obligations

In a highly significant patent dispute known as the "patent trial of the century," Apple filed a lawsuit against Samsung in 2011, accusing them of patent infringement related to Apple's iPhone, iPad, and iPod products. California jury board awarded Apple \$1 billion in damages in 2012 and banned Samsung from selling its Galaxy 10 tablet in the US. This case set a precedent for determining how close a competitor can come to an industry-leading product like Apple's iPhone without violating its patents.

Later on, Samsung re-sue Apple on another patent case. Samsung subsequently won a patent infringement case against Apple that banned a handful of older iPhone and iPad devices. In 2014, Apple sued Samsung again, claiming infringement of five patents covering hardware and software techniques for handling photos, videos, and lists used on the Samsung Galaxy 5. U.S. Court of Appeals reaffirmed the allegation and dictate Samsung to compensate \$930 million, which was rejected by Apple and resumed in May 2018 to recalculate the damages of Samsung's infringement.

Complicating matters further, Apple has been a major customer of Samsung's for flash memory processors, graphic chips, solid-state drives, and display parts. These legal battles between Samsung and Apple highlight the intricate relationships among leading computer companies [2].

7.3 Accountability and control

Individuals must assume responsibility for their actions, which is not always the case when engaging in online activities such as chatting, sharing, and browsing. The impact of our words on those physically present is more noticeable compared to the virtual realm of social media. The anonymity provided by the internet often leads individuals to believe that they can harass, abuse, and bully others without facing consequences [17].

In a 2019 report by headspace National Youth Mental Health Foundation, it was revealed that 53 percent of young Australians have experienced cyberbullying [18]. Tragically, in 2018, a young Australian girl took her own life as a result of persistent online abuse, sparking a national discussion on cyberbullying and responsible social media usage among young people [19].

To address the rising number of Australians targeted by such attacks, the Australian Government has taken action with the implementation of the Online Safety Act 2021. This legislation provides legal guidelines on holding cyberbullies accountable for their actions.

7.4 System quality

In August 2016, Delta Airlines faced a major system failure that led to the grounding of thousands of flights and numerous delays and cancellations. The failure of a piece of electrical equipment at one of its Atlanta facilities shut down its computer systems worldwide.

Southwest Airlines face a similar chain of events three weeks before Delta as well. A single notebook-size router failed at a data center in Dallas, resulting in about 2,300 canceled flights over four days. The failure itself lasted only an hour, but it took 13 hours to reboot the carrier's computer systems [20].

These scenarios are highlighting the vulnerability of airline systems and the impact it can have on travel plans and customer satisfaction. These outages have called into question the reliability and quality of ICT services. Are these outages acceptable?

7.5 Quality of life

Doctors in Partners HealthCare complained about EPIC electronic medical record (EMR) system. They gave feedback that the EMR system make they job even more complicated due to additional 2 hours of digital paper report, instead of helping them work more efficiently. The feeling of over constrained, personal frustration and feeling of inefficiency, sudden change on workflow, and some other factors were impacting the doctor work satisfaction and quality of life [21].

Beside mental health, physical health may be negatively impacted by ICT as well. Such as, Repetitive Stress Injury (RSI) occurred when muscle groups are forced through repetitive actions of tens of thousands of repetitions under low-impact loads. Or, Carpal Tunnel Syndrome (CTS), in which pressure on the median nerve through the wrist's bony structure. Both are caused by the pressure by constant repetition of keystrokes [2].

8 Future Works

This section outlines potential directions for future research to enhance the comprehensiveness and applicability of the study on the role of ethics in business information technology.

- **Update the Literature Review:** To ensure the relevance of the cited works, future research should include an updated literature review by incorporating more recent references.
- **Include Real-Life Examples or Case Studies:** To bridge the gap between theoretical concepts and real-world applications, future studies should incorporate more real-life examples or case studies to illustrate the ethical dilemmas discussed. This should be accompanied by updated inclusion criteria and an analysis of the correlation between the cases.
- **Clarify Legal Ambiguities:** Further elaboration and analysis on how ICT practitioners navigate legal ambiguities and operate within zones of legal uncertainty can provide critical insights into the industry's challenges.
- **Offer Recommendations or Practical Implications:** Developing a practical framework that allows organizations to navigate ethical dilemmas in business information by offering recommendations or practical implications.

9 Conclusions

Ethics in business information go beyond mere legal compliance. While formal laws provide a framework for conduct, they may not always keep up with the rapidly evolving landscape of technology. Ethical considerations help fill the gaps where laws may be inadequate or lagging.

By integrating ethics into their practices, organizations can efficiently address potential risks, which is ensuring that their actions align with moral standards and the pursuit of fairness. Ethical decision-making takes into account the impact of social responsibility, including issues such as privacy, data protection, intellectual property, and social responsibility. Overall, ethics in business information provide a guiding compass for responsible and sustainable digital transformation.

However, this research area still has many aspects to be expanded. The ongoing evolution of ICT continues to present new ethical challenges that require careful consideration and proactive management. From a qualitative research perspective, future efforts should include updating the literature review, incorporating real-life examples, offering practical recommendations, expanding on case studies, and clarifying legal ambiguities. From a practical approach, developing frameworks to help practitioners create ethically aligned products is essential.

These efforts will ensure that ethical considerations remain at the forefront of digital transformation, promoting responsible and sustainable business practices.

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